Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1-226 (cancelled)

227. (New) A system for in vitro producing a mammalian pre-embryo, said system comprising

- means for obtaining a mammalian oocyte, and
- means for obtaining a mammalian spermatozoa, and
- an apparatus having at least two separate air-tight chambers, for which the oxygen tension of one chamber may be changed independent of the oxygen tension of the other chamber, said at least two separate air-tight chambers constitute a main chamber and at least one residence chamber, where said at least one residence chamber are smaller than said main chamber, and are located inside the main chamber and/or are attached to the main

chamber, said apparatus comprising at least one entrance port capable of communicating with the means for obtaining the mammalian oocyte and/or the mammalian spermatozoa, and

- an exit port for withdrawal of the pre-embryo, as well as
- a communication port between said at least two chambers allowing transfer of oocyte, spermatozoa and/or pre-embryo between the chambers.

228. (New) The system according to claim 227, wherein the means for obtaining a mammalian oocyte is a system with a needle communicating under airtight conditions with a means for transferring from needle to said apparatus, such means for transferring comprises syringe and tube.

229. (New) The system according to claim 227, wherein the means for obtaining a mammalian spermatozoa is a system in which the oxygen tension can be controlled.

230. (New) The system according to claim 227, wherein the temperature of each chamber can be regulated independently.

231. (New) The system according to claim 227, wherein the oxygen tension of each other chamber is regulated independently by adding oxygen, nitrogen, carbon dioxide,

helium or another inert gas, or a mixture of two or more of these gasses simultaneously with removing gas from the chambers, in the way that the pressure of the air is in accordance with the atmosphere.

232. (New) The system according to claim 227, wherein the humidity of each chamber can be controlled and regulated to a level between 50 and 100%.

233. (New) The system according to claim 232, wherein said entrance port and said exit port are combined to an air lock and the atmosphere of said air lock can be controlled and adjusted in respect of the contents of oxygen, nitrogen, carbon dioxide, helium or another inert gas, and in respect of the temperature and humidity.

234. (New) The system according to claim 227, wherein a microscope can be placed and used when handling the oocytes, spermatozoa and embryos.

235. (New) The system according to claim 227, wherein a working area is obtained within said main chamber, said working area comprises a place for culturing means containing the cultured cell structures, where the cultured cell structures is observed in the microscope, and said working area comprises room for handling means.

236. (New) The system according to claim 235, wherein a micro-insemination apparatus is placed within the main chamber.

237. (New) The system according to claim 227, wherein the main chamber comprises opening means permitting entrance to human to handle the cell culture or the equipment inside the chambers.

238. (New) The system according to claim 237, wherein to the opening means is attached sticks, bars or instruments manipulated by fibre optics, by which the cell culture or the equipment can be handled.

239. (New) The system according to claim 227, wherein the main chamber has at least one small part of its surface replaced with a membrane, said membrane is sterile and has a structure through which a needle can be struck through, when the needle is removed said membrane fills up the area where the needle stuck was through, and no gasses or particles can diffuse through the membrane either when a needle is stuck through the membrane or no needle is stuck through the membrane.

240. (New) The system according to claim 239, wherein said residence chambers constitute boxes for culture containers containing cell cultures of oocyte, spermatozoa, embryo, and stem cells including stem cell lines.

241. (New) The system according to claim 227, wherein the oxygen tension and pressure of each chamber or air-tight boxes can be regulated by a computer by retrieving an image of the embryo in said chamber or said air-tight boxes.

242. (New) Use of the system according to claim 227 for culturing cell structures.

243. (New) Use of the system according to claim 227 for culturing gametes, embryos, blastocysts, stem cells, stem cell lines.